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THE SECRETARY OF DEFENSE  
WASHINGTON

MAY 2 1958

Dear Mr. President:

A summary of progress on the ICBM and IRBM programs during April is attached.

Attempts were made during April to flight test an ATLAS, THOR, and a Project ABLE re-entry test vehicle, which uses a THOR booster as first-stage propulsion. Malfunctions in the propulsion system terminated each of the three flight tests. Post-test analyses of data indicated turbopump failures in the ATLAS missile and in the THOR booster of the Project ABLE vehicle and a malfunction in the fuel feed system of the THOR missile.

The eighth JUPITER flight test missile was fired on 18 May to test the 150,000-pound thrust engine equipped with a factory modified turbopump and to test and recover a full-scale re-entry nose cone. The flight of approximately 1300 nautical miles was successful in accomplishing all test objectives. The propulsion system operated well and the nose cone, recovered within four and a half hours after impact, appeared to be in excellent condition.

As a result of the continuing investigations and tests carried on since turbopump failures were indicated as the cause of propulsion system malfunctions in flight tests, it is believed that certain interim modifications can be made to the turbopump and its mounting that will enable continuation of the missile development and flight test programs without further delay. Studies to produce a permanent solution are being actively pursued for use in the production of missiles. Additional flight test verification is required to prove both the interim and permanent solutions, although the recent JUPITER flight test success is most encouraging.

Unless the impending flight tests reveal further design difficulties, it does not appear that a change in the IOC dates will be required.

With great respect, I am

Faithfully yours,

*John F. Kennedy*



Attachment

The President

The White House

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Authority *MR 80-226 #2*

by *bc* NLE Date *5/13/80*

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SecDef Cont. No. *843-58*

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SUMMARY

Authority MA 78-3 #26

By SC NLE Date 2/22/79

ATLAS (ICBM) PROGRAM

ATLAS 15A, the seventh flight missile, was flight tested on 5 April. The missile flew as programmed for 105 seconds of the 127 seconds of intended powered flight when thrust termination occurred. Post-test analyses of data revealed that thrust termination apparently resulted from a failure of the No. 1 booster engine turbopump. General Electric radio tracker and Burroughs computer system No. 2 operated satisfactorily in an open loop condition during the flight.

ATLAS 16A, the eighth and last Series A flight missile, underwent a flight readiness firing on 18 April. The test was manually terminated after approximately 3 seconds when blockhouse instrumentation indicated a propulsion malfunction. Investigation revealed that desiccant crystals from a cloth bag accidentally left in the engine plumbing caused the malfunction. The bag broke when the engine started, and the desiccant was carried throughout the propulsion system. Measures have been taken to prevent the occurrence of similar incidents.

ATLAS 14A successfully underwent three full 127-second duration captive tests.

ATLAS 1B underwent a successful firing of 5-seconds duration on Sycamore Canyon test stand S-2 on 10 April.

Plans are underway to reorient part of the ATLAS program. The concept of the new program is to introduce an all-inertial guidance capability into the missile as soon as practical and to disperse launch facilities. Emphasis will be upon salvo capability rather than upon refire capability. The new concepts will not affect activation dates of the first ATLAS squadrons.

Construction of the first ATLAS launch complex at Cooke Air Force Base is on schedule. Installation of equipment in the guidance facility began 21 April.

The 576th Strategic Missile Squadron, the first ATLAS squadron to be activated, and the 394th Missile Training Squadron (ICBM) were activated at Cooke Air Force Base effective 1 April.

TITAN (ICBM) PROGRAM

Four engine firings were conducted on the TITAN first-stage battleship test stand in April to test airframe and engine compatibility. The third and fourth firings were completely successful.

Studies are underway at Martin to determine how fragmentation of the TITAN second stage can be accomplished to provide nose cone decoys and make enemy interception more difficult.

Capacitor failures encountered in ARMA computers during April may result in a slippage of from three to five weeks in delivery dates for six of the computers. The slippage is not expected to affect the overall program.

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Proof tests of a redesigned injector for the TITAN first-stage propulsion system were successful. The conclusion of these tests permitted re-initiation of the preliminary flight rating test series.

The manufacture of TITAN first-stage booster engines is on schedule. The first flyable second-stage sustainer engine will be assembled in May.

Remington Rand Univac computer No. 3 was accepted by the Air Force on 10 April for integration into ground radar No. 2 at Bell Telephone Laboratories, Whippany, New Jersey.

Construction of TITAN launch facilities at Air Force Missile Test Center continued on schedule.

A design-construction schedule compatible with operational requirements has been established for construction of the operational system test facilities at Cooke Air Force Base. Construction will begin in mid-July. The facilities will be used for operational checkout of personnel and equipment and for training purposes. In an emergency, the facility could be used for operational launches.



#### THOR (IREM #1) PROGRAM

THOR 121, the thirteenth flight missile, was unsuccessfully launched on 19 April. Although the cause has not been completely determined, flight data indicate a malfunction in the fuel feed system. Minor damage to the launch facility will not delay the program.

Project ABLE Re-entry test vehicle No. 1 was launched on 23 April. The vehicle used THOR 116 for a first stage, a VANGUARD second stage, and carried an ablating nose cone. After 146.3 seconds of flight, an explosion occurred in the THOR booster. Test data indicate turbopump failure, but investigation is continuing.

THOR 110 underwent two successful firings at the Douglas Sacramento captive test facilities during April to check out the instrumentation and launch facility.

THOR 124, the first captive test missile to incorporate full guidance and nose cone subsystems, was erected at Missile Static Test Site\* on 26 April. The missile will be used for training Air Force operational personnel.

The first of a series of meetings to coordinate general operating arrangements between contractors concerned with THOR deployment to the United Kingdom (Project EMILY) was held at Douglas on 8 April.

An Air Force presentation on the THOR and JUPITER programs was given for NATO Foreign Ministers in mid-April.

THOR 138, the first operationally configured missile, is undergoing final checkout at Douglas, Santa Monica. Douglas has installed additional final checkout stations and will expedite THOR production.

\*Formerly Edwards Rocket Base at Edwards AFB.

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The blockhouse for the first THOR training facility at Cooke Air Force Base has been completed and is scheduled for acceptance early in May. Construction of the second and third launch training facilities at Cooke is progressing on schedule.

## JUPITER (IREM #2) PROGRAM

No JUPITER missiles or REDSTONE missiles carrying JUPITER test missions were fired during April.

Laboratory tests on the turbopump gear box were continued through April in an attempt to isolate the exact cause of early engine shut-down experienced on earlier missile flights. The manufacturer of these pumps, North American Aviation Company, has participated in the tests and has made the modifications indicated by the tests.

The eighth JUPITER flight test missile (JUPITER Missile 5) is scheduled to be fired on 15 May 1958. This missile will also carry a full scale heat-protected nose cone with recovery gear. This will be the first attempt to recover a full-scale IREM nose cone fired to tactical range.

The first JUPITER Tactical Launcher has been completed and successfully tested with the JUPITER lightweight erection system.

The JUPITER Integrated Weapon System Training Plan (supplementing the JUPITER Operational Plan dated 4 March) was distributed. The 864th and 865th Strategic Missile Squadrons will receive part of their training at the Army Ballistic Missile Agency and the remaining part overseas; the 866th and 867th Strategic Missile Squadrons will be trained at Cooke Air Force Base.

## POLARIS (FLEET BALLISTIC MISSILE) PROGRAM

The Fleet Ballistic Missile development program is progressing satisfactorily.

The static test program is behind schedule but is being remedied by establishing additional sources of supply for the motor metal parts which have been a problem since January 1958.

Two POLARIS A first-stage and three POLARIS A second-stage motor static tests were conducted during April.

Flight Test Vehicle 1-11 was successfully flight tested at Air Force Missile Test Center on 18 April.

Two full-scale structural test vehicles were successfully launched from the submerged POP-UP installation.

The first four ballistic drop tests of full scale re-entry bodies were conducted successfully at the Naval Air Ordnance Test Station, Chincoteague, Virginia.

